Utilizing Pitsco STEM and WorkKeys to Promote Career Readiness in North Carolina

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Introduction

The state of North Carolina has a thriving set of career and technical education (CTE) programs. Two aspects of these programs are Pitsco STEM[1] and ACT® WorkKeys®. Pitsco STEM offers hands-on programs where students can practice skills related to science, technology, engineering, and mathematics (STEM). All of the programs are designed to ensure that students are building the resilience and adaptability required to solve the challenges of the future. Stated in another way, Pitsco STEM shows students how STEM is applied in the real world in order to increase awareness and interest. ACT WorkKeys operates in a complementary role by testing students on foundational workplace skills (e.g., mathematics, reading comprehension, interpretation of graphics). Moreover, students can earn an ACT® WorkKeys® National Career Readiness Certificate® (NCRC®), which certifies skills to potential employers and postsecondary training programs (ACT, 2014). Taken together, these programs are designed to get students thinking about career possibilities at an earlier age so they can get a head start on career planning. The typical progression is for Pitsco STEM to be offered during middle school and WorkKeys during high school.

The purpose of the current study was to qualitatively assess the efficacy of these programs by interviewing five CTE county leads in North Carolina. The interviews shed light on best practices for implementing both Pitsco STEM and WorkKeys. The goal of gathering this information was to provide free knowledge and ideas for improving CTE programs both within and outside North Carolina. The five leaders we interviewed for the current study are listed below. We confirmed the information they shared and their willingness to attach their names to this study prior to publication.

- Amy Jones, Lenoir County
- Erica Jones, Duplin County
- Holly Tolston, Craven County
- Beth Ann Trueblood, Pitt County
- Flonnie Wullenwaber, Pender County

[1] https://www.pitsco.com/

Method

All the CTE leaders were interviewed independently using seven standardized interview questions (see below). The answers were recorded and aggregated, and are presented in the Results section.

1) How does your school/district implement the Pitsco STEM curriculum?
2) Do you think it (Pitsco STEM) has been effective (career exploration, preparation, etc.)? Why?
3) Do you think the WorkKeys Curriculum prepares students for the WorkKeys Assessments? Why?
4) What advice would you give other schools looking to use the WorkKeys Curriculum or WorkKeys Assessments?
5) How do you communicate the value of taking WorkKeys and earning a WorkKeys National Career Readiness Certificate (NCRC)?
6) Is WorkKeys and/or the NCRC recognized by local employers or postsecondary training programs?
7) Are there any other thoughts on these topics you would like to add?

Results

Pitsco STEM Implementation

All the surveyed counties use the Pitsco STEM labs in their middle schools, which encompass Grades 6–8. Several aspects of the implementation would likely benefit other counties. First, several counties used Pitsco STEM on a pilot basis before rolling it out to all middle schools in the county. This allowed the leaders to work out program issues prior to expansion. Second, several counties mentioned grants (e.g., Duke Energy in Lenoir County) that could be applied for to provide funding for STEM education. Specifically, Erica Jones said that the Pitsco STEM labs in Duplin County are entirely funded by a Golden LEAF Foundation grant. Flonnie Wullenwaber also mentioned the Golden LEAF Foundation as a funding source in Pender County.

One big theme in all the responses was the importance of alignment. Alignment was seen as important both within a school or school system and within a community. Several counties mentioned that in order to increase alignment within a school system, they created clear links between middle school Pitsco STEM coursework and high school CTE coursework. Another means of increasing alignment within a school system was careful selection of the teachers who would oversee the Pitsco STEM labs. For instance, Duplin County uses only technology-certified teachers. Similarly, Pender County has an instructor wholly dedicated to STEM. Lastly, the majority of the interviewed leaders mentioned alignment between their school's curriculum and the courses taught at their local community college.

The majority of the respondents also referenced working with their local government and/or local employers when setting up their Pitsco STEM labs. For example, Duplin County has a lot of agricultural companies, so Duplin County schools added agricultural labs as a result. As another example, Craven County has an excellent relationship with Marine Corps Air Station Cherry Point, which is a large local employer of engineers. Pitt County reached out to multiple local employers and asked them to pick the Pitsco STEM labs they thought were most similar to the work they were doing. In sum, the local leaders we interviewed discussed the importance of alignment between education and local employment opportunities in order to provide job-related training during middle school. This type of work helps students see a direct link between schoolwork and available careers in the community.

The alignment strategies discussed in this section reflect an "It takes a village" mentality where Pitsco STEM offers the most value when it is aligned with other opportunities within a local school system (e.g., high school CTE work) and community (e.g., local career opportunities). To have the most impact, Pitsco STEM should be integrated with all educational and employment opportunities in an area. This integration also needs to be communicated to students in order to increase understanding and the motivation to learn.

Pitsco STEM Efficacy

All the respondents felt that Pitsco STEM was an effective tool for career exploration for their middle school students. Several respondents discussed how Pitsco STEM labs helped guide students toward STEM courses in high school. Erica Jones mentioned that the Pitsco STEM labs provided a good first taste for students and helped students pick courses of interest in high school. Amy Jones discussed Pitsco STEM helping teachers find middle school students who might be interested in taking computer coding in high school. Beth Ann Trueblood mentioned several additional positive aspects of the Pitsco STEM program. First, she noted an increase in standardized test scores in math and science and noticed an increased comfort with math and science material. Second, Beth Ann felt that students became better listeners and more capable of functioning in teams as a result of the group-based aspect of many Pitsco STEM modules. This suggests that an ancillary benefit of Pitsco STEM is increased development in social and emotional learning (SEL), which has been found to predict success in school and the workplace (Casillas, Way, & Burrus, 2015; Poropat, 2009). Flonnie Wullenwaber also mentioned how Pitsco STEM labs help apply STEM knowledge to real-life situations. For instance, in one module, students build a greenhouse from scratch and take scientific measurements (e.g., condensation).

WorkKeys Preparation

The study respondents indicated that the ACT® WorkKeys® Curriculum and other preparation materials were helpful in preparing high school students to take WorkKeys. Specifically, Amy Jones mentioned that the test preparation materials were helpful for the ACT® WorkKeys® Workplace Documents assessment because that assessment contains a lot of technical reading not generally covered in English/Language Arts courses in Lenoir County. Several respondents also mentioned specific strategies for WorkKeys test preparation. Beth Ann Trueblood said that the high schools in Pitt County increased test motivation by creating competitions between classes using the WorkKeys Curriculum materials. Flonnie Wullenwaber did not use the WorkKeys Curriculum but purchased some test prep books from McGraw Hill for every CTE instructor. Flonnie also mentioned the implementation of "Workplace Wednesdays," when teachers use 15–20 minutes of class time to prepare for WorkKeys. The use of class time to prepare for WorkKeys was mentioned as an effective test preparation strategy by several high schools from a similar study in Alabama (Conway & Steedle, 2020).

WorkKeys Advice

The CTE leaders we interviewed offered a few pieces of advice for others looking to use WorkKeys and the test prep curriculum. First, Beth Ann Trueblood emphasized the need to prepare students for WorkKeys by giving them access to the WorkKeys Curriculum. The Curriculum gives students a chance to see what types of questions appear on the WorkKeys Assessments. The need for students to see the Curriculum was underscored by the fact that most students in Pitt County do not retake WorkKeys, regardless of their initial score. Second, Flonnie Wullenwaber stressed the need to communicate that WorkKeys is broader than CTE and measures K–12 learning in all students.

Value of WorkKeys and NCRC

The interview respondents provided several creative ways to communicate the value of WorkKeys and the NCRC to test takers. Amy Jones discussed a multipronged approach to creating awareness using communication tools such as Facebook, CTE Twitter, and student email groups. Lenoir County also announces silver, gold, and platinum NCRC distinctions during their awards day. Erica Jones mentioned informing students early on (8th–10th grades) about the assessments and their value. Erica also communicates to students that Duplin County is a Work Ready Community (WRC)[2] where several large employers require an NCRC in order to complete a job application. Holly Tolston mentioned several creative strategies used in Craven

[2] https://www.workreadycommunities.org/

County and another county where she used to work. Holly's previous county incentivized high scores using beach toys, Bojangles gift cards, and donuts (with chocolate milk). Craven County uses Canvas to send informational material to students via email and social media. Flonnie Wullenwaber mentioned that telling students about the potential career benefits of an NCRC can increase test motivation. Flonnie also said that ACT and their local community college could do more to promote the WorkKeys Assessments and their benefits.

WorkKeys Recognition

There was a mixed response to the question about whether local employers recognize the NCRC distinction. Amy Jones and Holly Tolston said that they do not have local employers that recognize WorkKeys/the NCRC but that their local community colleges do or are at least aware. The other three respondents said that several local employers recognize WorkKeys/the NCRC. (WorkKeys recognition for these employers indicates that the employer sees the credential as a positive sign but does not require an NCRC for job applicants.) Erica Jones added that Duplin County has a county partnership for career planning that includes local businesses and supports job shadowing, career and college fairs, and pathway discovery. Beth Ann Trueblood mentioned that about 15–20% of local businesses require a WorkKeys NCRC, and one business will not interview anyone without an NCRC distinction. Flonnie Wullenwaber said that six to eight local employers recognize WorkKeys/the NCRC, including the hospital system. She said that, in general, larger employers know about WorkKeys/the NCRC, but smaller ones do not.

Summary

Across the questions asked and the CTE leaders surveyed, several key themes emerged that others could emulate. First, the alignment of CTE programs is key within a school system and in a community at large. A natural starting place for such alignment is between middle school and high school. The Pitsco STEM labs offered in middle school should be directly linked to offerings in high school. Furthermore, the *North Carolina STEM School Progress Rubric* recommends CTE courses be fully integrated into strategic plans and operations and also suggests providing credentials for CTE coursework.[3] For those at the beginning of their CTE journey or looking to jump-start it, it would be worthwhile to investigate possible grant funding. Two of the surveyed CTE leaders used grant money to fund a portion of their CTE work. Several of the surveyed leaders also mentioned the importance of getting buy-in for CTE programs from teachers and administrators, especially at the beginning of the process. Buy-in is also important for increasing test motivation for taking WorkKeys and earning an NCRC. One method of doing so is providing incentives for

[3] https://files.nc.gov/dpi/stem-school-progress-rubric-rev-9_19.pdf

students who do well on the assessments (e.g., adding scores to report cards, entering high performers in raffles). Providing access to preparatory materials such as the WorkKeys Curriculum is also important for increasing work readiness and maximizing test scores. Lastly, cultivating relationships with local employers can help with multiple issues discussed in this paper (e.g., CTE course alignment, test-taking motivation, grant funding).

To finish, we thank the CTE leaders interviewed for their time, and we hope their insights can help others inside and outside North Carolina in developing and improving their CTE offerings.

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